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ABSTRACT

Four significant aspects of the leadership management course development project (run by Westinghouse Learning Corporation for the United States Naval Academy See EM 010 418, EM 010 419, and EM 010 484 for the final report) are discussed. The aspects explained are course structure, evaluation procedures, constraints imposed on the course structure by the research design, and the delivery logistics. Related documents appear under EM 010 418 through EM 010 447 and EM 010 451 through EM 010 512. (Author/RH)

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LEADERSHIP COURSE - PHASE I

COURSE STRATEGY

CONTRACT NO. N00600-68-C-1525

TP-6.4 March 21, 1969

EM 010 478

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March 21, 1969

COURSE STRATEGY

Contract No. N00600-68-C-1525

Abstract

This report explains four significant aspects of the Leadership Management Course development project. These four aspects are course structure, evaluation procedures, research design constraints, and delivery logistics.

Approved by:

_____
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TP-6.4

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1. INTRODUCTION

This report explains four significant aspects of the Leadership Management Course development project. While these four factors comprise the total project, they must be discussed separately to minimize any misunderstandings. These four aspects are:

a. course structure (terminology and overview).

b. evaluation procedures (per course, per research).

c. constraints imposed on course structure by the research design.

d. delivery logistics of the above (per Midshipmen, per instructor).

2. COURSE STRUCTURE

The Leadership Management Course is divided into eight classifications, as follows:

I. Parts

A. Units

1. Segments

a. core learning

1) module

2) section

b. depth learning

c. enrichment learning

The following discussion describes the nature of each of these divisions.

2.1 PARTS

The part is a designation based on the content aspects of the total Leadership Management Course. Thus, for example, there is a part on Group Dynamics, and a separate part on Individual Behavior. These parts have also been referred to as "chapters" in informal communication among the project participants. Twelve parts are envisioned for the course. They are:

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Title		Weight*
I.	Introduction	4/44
II.	Individual Behavior	5/44
III.	Group Dynamics (Behavior)	4/44
IV.	Communication for Effective Leadership	5/44
V.	Military Management.....	5/44
VI.	Authority and Responsibility.....	3/44
VII.	Leadership Behavior and Styles	3/44
VIII.	Senior Subordinate Relationships	4/44
IX.	Morale & Esprit de Corps	2/44
X.	Discipline	2/44
XI.	Personnel Evaluation (may be covered in controlling phase)	1/44
XII.	Summary and Review	4/44

2.2 UNIT

A unit is another classification used frequently during this project. However, the term unit, as used here, designates a course division or classification that is significant mainly to the research aspects of the project, not the course structure. To emphasize this fact and avoid confusion, units are discussed in Section 3 of this report.

*This weighting has been suggested by the USNA, and at this writing, appears essentially accurate. However, as actual materials production and other considerations may necessitate some changes, it cannot be deemed final. Quizzes, which are not tallied, had a weighting of 2/44 in this estimate.

2.3 SEGMENTS

A segment is a collection of learning objectives that are closely related by content and educational purpose.

Content relationship is seen in the objectives with which a segment deals. For example, in Part Four, Achieving Effective Communication, the many learning objectives are collected under a lesser number of sub-groups (segments) such as Importance of Interpersonal Communication.

Educational purpose refers to the generic learning purpose which the content of the segment is intended to serve, i.e., it is either (1) a core learning segment, (2) a depth learning segment, or (3) an enrichment learning segment.

A segment is also capable of conceptualization in two more ways. The constraints of scheduling force the segment to be conceived in terms of real-time parameters, i.e., because the entire course must be made to fit the time available, a segment is the most usefully-sized content framework within which real-time factors may be adjusted and discussed. Thus, segments become useful conceptual tools with which the course designers can adjust course content to fit time constraints. In informal staff discussions regarding this time element, a segment has often been referred to as "a period of instruction, generally estimated at 40 to 80 minutes of student time." The total course is estimated to contain approximately 80 segments.

While these are useful and necessary parameters, it must be recalled that the real-time element of a segment is secondary to its operational definitions; a segment is generically defined as

learning objectives clustered together by reason of content and educational purpose.

A final way of viewing a segment is in terms of the actual initiator of the work involved in completing a segment. All segments are scheduled, in the sense that learning tasks are spelled out and each Midshipman is expected to complete the course by year's end. Also, segments requiring the use of a particular audio-visual device, of which there is a limited supply, might be considered "scheduled" according to the dictates of equipment availability.

However, once a Midshipman is assigned a segment that requires, for example, the reading of a text, the Midshipman can initiate his own time schedule within the segment, i.e., he may daydream for a while before he begins to read. When a segment requires instructor-led group discussion, the delivery logistics demand that a Midshipman be present at the convenience of the instructor and other group members, rather than at his own convenience. Thus, segments will occasionally be referred to as scheduled or unscheduled.

Scheduled segments are those that demand the Midshipman meet human-time constraints other than his own. In this instance, some formal method of prescheduling is set out in advance.

An unscheduled segment is generally free of any human media, other than the learner himself, and the actual work is initiated at the learner's convenience alone, except for ever present peer and instructor persuasion to keep up or get ahead.

Because segments are discussed in terms of any one of these four parameters, one must be sure the word segment is being used

in a commonly understood context.

2.3.1 Core Learning

Core learning is that which is necessary to assure the Midshipmen's ability to meet the terminal objectives of the part. Thus, it is required.

Generally, core learning is unscheduled, in the sense that the presentational variables are non-human, and the response acceptance and demands can be met individually by the Midshipman without regard to peers or the instructor. Thus, core learning is scheduled only in the sense that it belongs to a sequence of segments to be completed before a part can be completed.

2.3.1.1 Module. A module is the treatment (or vehicle of instruction) applied to the content of a segment, i.e., a module refers to the instructional presentation variables used in a segment. This classification is important to the search for data regarding which presentational variables are most efficacious under which conditions, an important hypothesis in the overall research design. Thus, like the designation unit, module has relevance mainly to the research aspects of the project, and secondarily to the course structure itself. Therefore, modules are also discussed in more detail in the fourth section of this report.

2.3.1.2 Section. A section is a classification of course content that refers to only one type of instructional activity -- remediation. There are remedial sections, and no other types. A remedial section is one that accompanies a core learning segment and attempts

to achieve the same learning objectives. A remedial section is not required or used unless the Midshipman has failed to achieve a sufficient success in the core learning segment.

A remedial section may utilize an entirely new mix of media materials and presentational design to upgrade the achievement level of core learning objectives. Thus, the remedial section could be scheduled or unscheduled, regardless of the initiation characteristics of core learning that it accompanies. Depth and enrichment segments do not have an accompanying remedial section.

A remedial section may not be a new collection of materials - it will, in some cases, merely repeat parts of the accompanying core learning segment, depending mainly on the level of achievement a Midshipman has attained. Thus, it is difficult to determine the real-time estimates of a remedial section.

For example, consider a core learning segment, two objectives of which will enable the Midshipman to (1) list upon demand the characteristics of a particular interpersonal communication system, and (2) create a shipboard example demonstrating each characteristic. Further assume that the Midshipman is to acquire this ability by reading a book which discusses these characteristics and sets out general examples of each. One can then envision assigning a remedial section to a Midshipman who has read the book but is unable to achieve either of the two objectives described above. The remedial section could employ a film of shipboard situations, which, after displaying a communication event, freezes the action and verbally labels the communication system characteristic revealed in the scene. The film could then replay the scene again, and ask

the Midshipman to write the characteristics displayed on a form. After this remedial section, the instructor should discuss with the Midshipman those characteristics for which no examples occur. A remedial section could consist of a direction to return to the core learning text and reread the specific page where examples of the missing characteristics were cited.

In any event, the purpose of a remedial section is to increase the level of performance achieved by the Midshipman who falters after the completion of a core learning segment. Whenever a Midshipman adequately demonstrates core learning objectives, he avoids the remedial task.

2.3.2 Depth Learning

Depth learning accompanies a core learning segment and works toward the same objectives. Depth learning is required of all course participants. The purpose of depth learning is to expand the scope of acquisition of core learning objectives, beyond mere cognition. Generally, depth learning deals with the Midshipman's affective and emotional commitment to core learning content.

For example, using a core learning segment whose objectives center around the learning of certain principles of communication from a textbook, one could envision a depth learning segment that employs a group discussion. In this case, the Midshipman, along with his peers and the instructor, discusses the factors of interpersonal communication characteristics learned from the text in terms of application to examples from his instructor's personal experiences, and/or in terms of specific on-the-job leadership situations in which the Midshipman might find himself upon

graduation. The purpose here, is for each Midshipman to benefit from the realization of broader application possibilities. Secondly, assuming that it is important for a Midshipman to view his command situation in terms of communication characteristics, the charisma of a respected instructor can lend authority and purpose to what might otherwise be considered an irrelevant academic exercise. If this emotional commitment is achieved by the instructor's presence, the depth learning segment may be assumed to increase the probability that a Midshipman will use the knowledge acquired upon graduation, rather than just having acquired it.

One could also envision a depth learning segment in which the instructor and a group of peers, through role playing or some other simulation exercise, actually participate in events that demonstrate the communication characteristics. Drills during at-sea training assure more effective performance and more efficient use of a midshipman's formal education; in classroom simulation, similar results accrue, even though it is a lower approximation of real life.

2.3.3 Enrichment Learning

Enrichment learning works toward the achievement of core objectives. However, enrichment is not essential to the performance of these objectives. Like depth learning, enrichment segments are associated with core segment objectives, but the degree of association is much more loosely constructed. Enrichment

segments differ from core and depth segments in that they are never* required.

Using the communication example from the discussion of depth learning, a sample enrichment segment can be hypothesized. Given characteristics of a system of interpersonal communications, an enrichment segment might ask the Midshipman to read selected chapters of S. I. Hayakawa's Semantics to gain a greater appreciation as to why these characteristics are included as important aspects of an interpersonal communication network, or to gain historical information as to how some or all of the characteristics came to be isolated as significant features of a communication network.

Thus, enrichment learning enables a Midshipman to pursue in greater detail subjects and material that interest him, and relate to the content of a core segment in terms of background or further ramifications of that content. But, the information learned in an enrichment segment, while perhaps useful, is not necessary to achievement of the core segment's objective.

*For the purposes of this developmental project, some Midshipman may be initially required to take the enrichment segments. This must be done to at least see the internal effectiveness of such segments before they are made generally available. See Section 4, the research constraints section of this report.

3. EVALUATION PROCEDURES

Several evaluation procedures will be employed during the development of the Leadership Management Course. These procedures can be classified as follows:

1. course-specific evaluation
    a. administrative tests
        1) mid-term examination
        2) final examination
    b. progress checks
        1) prescriptive analysis
2. research-specific evaluation

3.1 FINAL AND MID-TERM EXAMINATION

The course-specific evaluation consists of two traditional evaluations: a mid-term examination, covering the first half on the total course content, and a final examination which covers the second half. These two tests will be administered as one test at the beginning of the course. These evaluation instruments will be a compilation of items covering the basic aspects of the total course. They will be scheduled for administration approximately halfway through the content and at course completion. This scheduling will be set out in advance, and all students must be prepared. The most significant purpose of these examinations is to provide a gross measure of overall course achievement. These are the only standard achievement tests in the course. In addition, these examinations will allow the USNA to assign grades, and will also serve as incentive devices.

3.2 PROGRESS CHECKS

Progress checks consist of 10 multiple choice items regarding the content of a segment. They are used (1) to control the flow of the individualized system to assure that every Midshipman has mastered the content of a completed segment with sufficient proficiency and (2) to prescribe, on the basis of the degree of proficiency reached, the Midshipman's next learning activity.

3.2.1 Assure Objective Achievement

Progress check questions will usually be taken directly from the behavioral statement of objectives for the segment. For example, given the objective:

> The M will be able to identify the requirements in receiving a message as:
>
> (1) detecting.
>
> (2) decoding

an appropriate progress check item might be:

> Which, if any, of the following represents a detecting, as opposed to a decoding, requirement of message receipt.
>
> (1) Receiver's psychological attention must be directed toward the sender.
>
> (2) The meaning of the received words must equal the sender's meaning.
>
> (3) Facial expression must be attached to the verbal symbols.
>
> (4) None of the above

Thus, when the Midshipman completes a segment, he will take the progress check for that segment's objectives to assure he has acquired the information and that objective achievement is monitored.

In addition to indicating his answer on a progress check, at the end of each question each Midshipman will also rate his confidence that his selected answer is correct. This confidence rating will be done on a probability scale where the Midshipman rates his confidence in his answer from 0 to 1.00.* Note that the confidence-rating technique will be employed for progress checks only, not on the other examinations.

3.2.2 Prescriptive Analysis

The second function of the progress check is to serve as a basis for prescribing the next learning activity. A prescriptive analysis is not a progress check itself, but is rather a method of analyzing the results of a progress check. Thus, for every progress check taken it will be necessary to make a prescriptive analysis of the results. The general nature of the prescription will depend upon the type of segment the progress check is testing. (See both Section 5 and the appendices for more permutations on this approach.)

For example, where the Midshipman has failed a progress check, there is only one obvious prescription-- to assign a remedial section. Where a Midshipman has passed a progress check, prescription is a bit more complex. He can now be prescribed:

---

* Shuford, E.H.; Massengill, H.E.; and Organist, W.E. On Communication and Control in the Educational Process. ESD-Tr-65-568, Decision Sciences Laboratory, L.G. Hanscom Field, Bedford, Mass. 1965.

(1) the next segment in sequence.

(2) the depth learning segment accompanying the core segment just completed

(3) an enrichment segment that accompanies the core segment just completed.

The most complex prescriptive task comes about when a Midshipman's score is somewhere in between fail and pass. If remediation is decided upon, it might be inefficient to have this Midshipman go through the entire content of the core segment, when he missed only a few aspects of such segment. It might be equally unwise to send this Midshipman forward to a depth, enrichment, or the next new core segment. To resolve this problem a standardized prescriptive analysis format has been designed. As can be seen from the hypothetical charts on pages 15 and 16, the Midshipman's prescription will be based on the number of questions he answers correctly. While it is not contemplated at this time, it is obvious that prescription could also be based upon some weighting of the midshipman's self-assessment of his confidence. This possibility for future course operation has broad potential. Under Step 3, the Midshipmen who are deficient will take remedial work in only those areas of error.

3.2.3 The Cumulative Post-Test

This test instrument is based on a unit classification of the total course. As was noted in Section 2, the unit is purely a research classification, and has little to do with the course delivery itself. A cumulative post-test will cover the basic

ANSWER SHEET AND PRESCRIPTIVE ANALYSIS

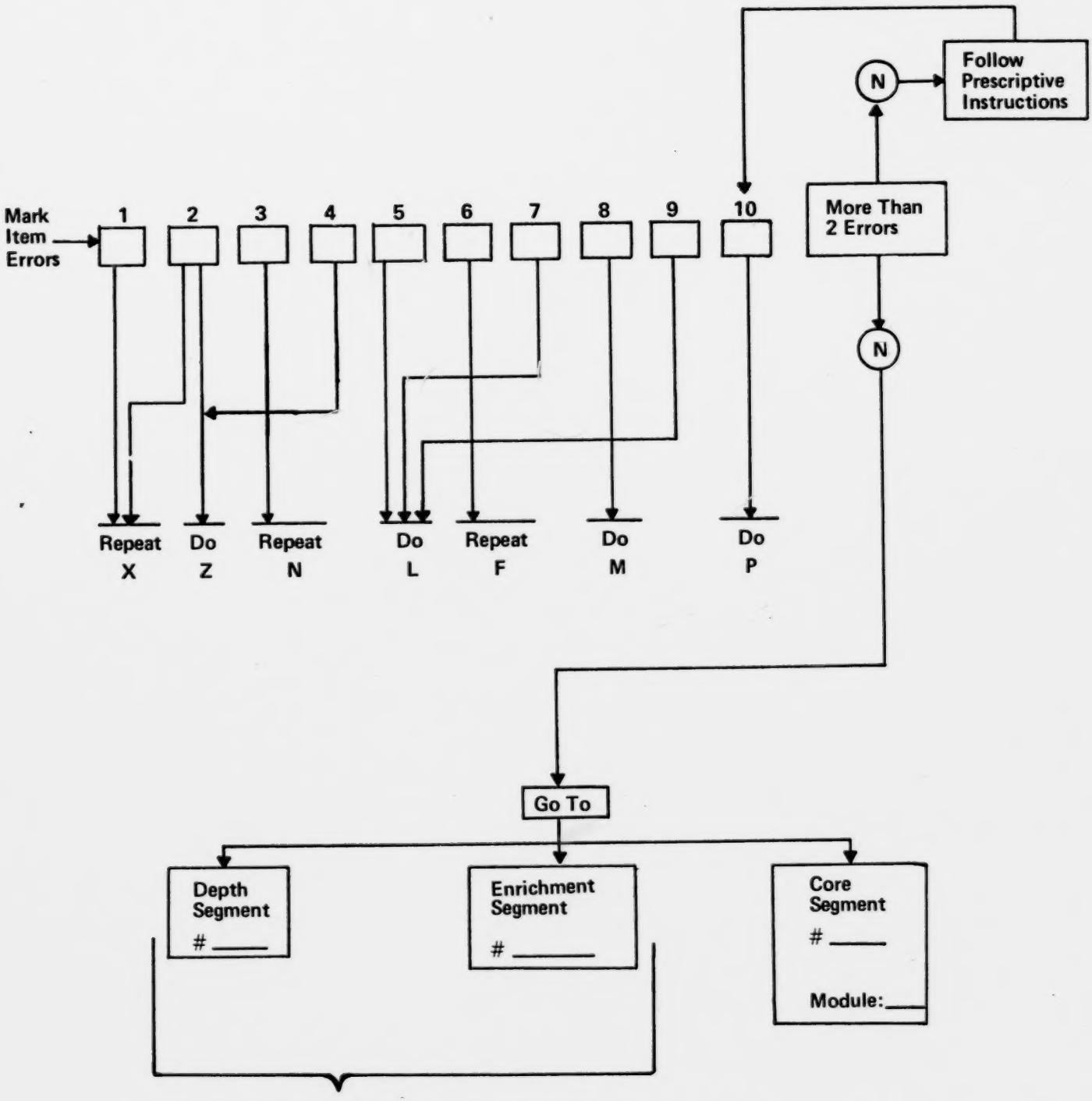
CORE SEGMENT # _____

Student # _____

Module # _____

Item:		1	2	3	4	5	6	7	8	9	10
Choice:	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Confidence Rate: (Probability Right)	.00	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.10	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.20	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.30	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.40	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.50	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.60	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.70	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.80	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	.90	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	1.00	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

ANSWER SHEET AND PRESCRIPTIVE ANALYSIS -- Continued



Caution: Consult Instructor For Permission

aspects of several segments, but it is necessitated by and used exclusively for the research aspects of this project. It is discussed in more detail in Section 4 of this report.

4. CONSTRAINTS ON COURSE STRUCTURE IMPOSED BY RESEARCH DESIGN

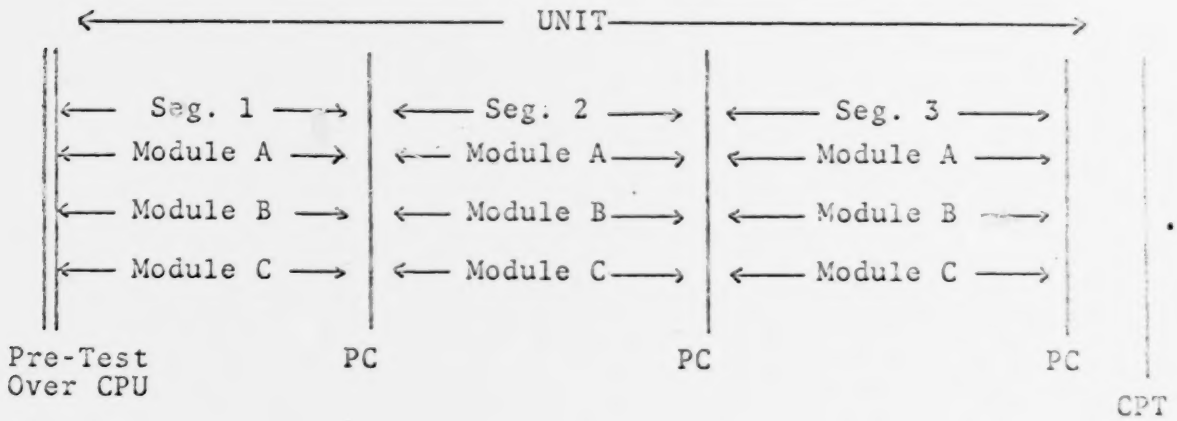
Sections 2 and 3 discussed the two basic components of Leadership Management Course structure. If the sole purpose of this project were to deliver course content in an innovative manner, there would be little else to add except examples of how all of the parts, segments, and progress checks would work in actual operation. However, this project also has a research requirement. A number of specific hypotheses regarding media and presentations are to be tested, and to obtain reliable data regarding these hypotheses, the basic course structure has been altered to some extent.

While some of these constraints make the first iteration of the course a bit clumsy, they are absolutely necessary to the success or failure of this project. Beyond the fact that the hypotheses to be tested will add vital knowledge to the field of education generally, many of the hypotheses pertain directly to the efficiency of this course itself. For example, if one particular presentational approach is more efficacious for content disseminated than others, how will the USNA know which mix to employ in the final operation of the course?

These constraints can be summarized in two additional structural classifications (units and modules) and one additional evaluation procedure (cumulative post-test). The unit is a collection of three to five closely related segments, the basic instructional content of which will be tested at one time. While each segment within a unit is concluded by a progress check, the unit

itself is followed by a special test called a cumulative post-test.[1]

Within each unit are several modules. A module is an instructional presentation; one module is distinguishable from another by variations in the presentation forms and/or media, even though the content is the same. Thus, a unit consisting of three segments might look as follows:



To see how this structure would operate to test research hypothoses, consider the following example hypotheses:

(1) Increasing the frequency of the response demand will increase the rate of and retention of cognitive acquisition.

(2) Overt response demands will increase the rate and degree of cognitive acquisition over covert response demands.

To test these example hypotheses, four modules are required: one containing a presentational form requiring a high frequency of student response and another demanding a low frequency of response; one module containing overt response demands and another containing covert response demands. Thus, the four necessary modules of this hypothetical example would look like this:

[1] The title post-test is no longer an appropriate title because these tests will also be used as pretests to satisfy sound research requirements. However, the title is retained to be compatible with early reports.

	UNIT		
	Segment 1	Segment 2	Segment 3
Module A	HF - OR	HF - OR	HF - OR
Module B	HF - CR	HF - CR	HF - CR
Module C	LF - OR	LF - OR	LF - OR
Module D	LF - CR	LF - CR	LF - CR

The content is determined by the segment and is the same in each module. Three to five segments are necessary, since each segment by itself is too small to give reliable test results. To test these hypotheses, the media employed in each module must also be the same, only the frequency of response and overt-covert aspects of the response are to be varied. Methodologically, to test this hypothetical set of variables, four groups of Midshipmen would be assigned to each of the four modules. This assignment would be made randomly. The cumulative post-test would be given to all Midshipmen upon entrance, and would again be given upon the conclusion of the unit.

One important condition to note is that the units and modular approaches are restricted to <u>core segments only</u>. This must be because core segments are the most amenable to research control, i.e., because minimum human or group interfaces exist in the core segments, the presentation variables can be adjusted as designed, and a minimum of extraneous variables enter into the student-materials interaction. Were a depth learning seminar to be introduced between core segments of a unit, it would be too difficult to avoid or control the charismic variables of the teacher and

peers.

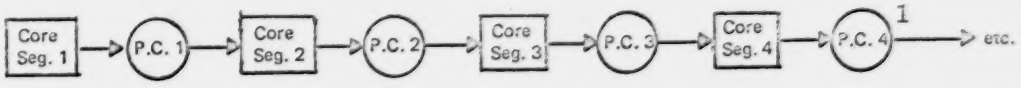
This condition seriously constrains the normal course structure. Assume, for example, that Segment 2 of the three segments that make up the research unit above had an accompanying depth learning segment. No Midshipman, regardless of which module path he was on during the unit, could be allowed to take the depth segment until such time as at least he had completed Core Segment 3 of the unit and taken the cumulative unit examination. If any modular group or single Midshipman took the depth learning segment that accompanies Core Segment 2 before the cumulative post-test, the usefulness of the comparative analysis would be seriously jeopardized. Section 5 discusses how the course is designed to serve both structure and research requirements.

5. DELIVERY LOGISTICS

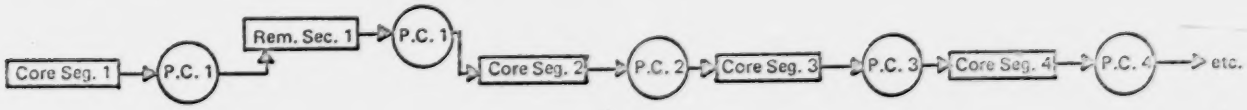
This section ties together, in operational examples, the course structure discussed in Section 2 and the evaluation procedures discussed in Section 3, and then places them into the constraints of the research design discussed in Section 4. Because the segment is the most useful level at which to discuss operational logistics, this section first reviews what might be termed the normal logistics of the course. Then, adjustments necessitated by the research design are made. Finally, a brief discussion of the specific logistics of student and instructor is presented.

5.1 NORMAL LOGISTICS OF DELIVERY

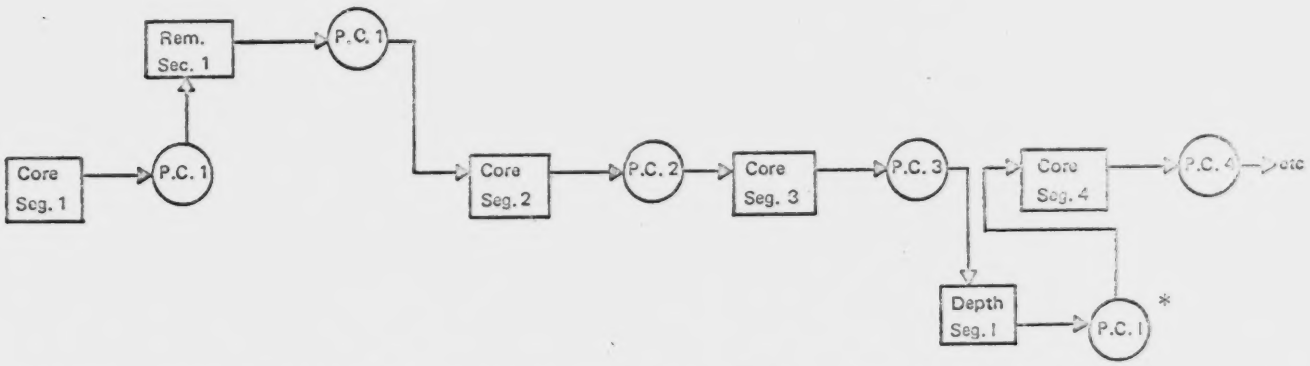
For Midshipmen, the course will begin with the pre-test (a compilation of the mid-term and final examination). He will then be instructed in the operational aspects of the course and begin with Part 1, Core Segment 1. He will work as follows through the progress check (P.C.) and next segments comprising the part:



However, this flow assumes that the Midshipman passed each progress check. Now, assume that he fails to pass Progress Check 1. Before going to Core Segment 2, he will have to take remedial work, and the flow will look as follows:



A remediation path (or section) will exist for every core segment, but it will be used only when needed, as indicated by progress checks. As was noted earlier, many core segments (singly) or in combination) have accompanying depth segments. Following the same hypothetical Midshipman, assume that, collectively, Core Segments 1, 2, and 3 have an accompanying depth segment. Further assume that this depth segment consists of a group discussion concerning salient factors of Core Segments 1, 2, and 3. The basic flow for this Midshipman would look as follows:

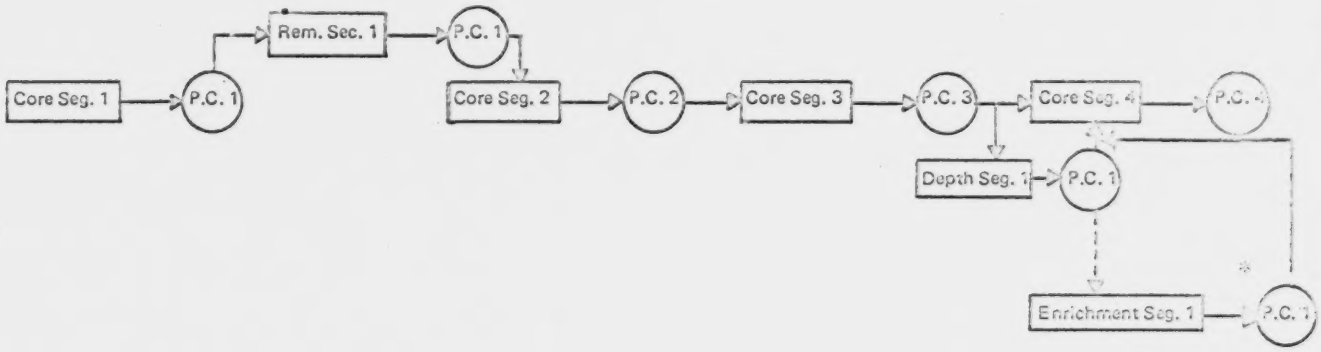


Because each Midshipman will be working at his own rate, not all will complete the first three segments at the same time. Thus, the depth segment cannot be scheduled until a group of Midshipmen have completed the first three segments. Some slack time must be allowed. Therefore, while the flow for the hypothetical Midshipman is an accurate representation of events, in terms of real-time it is conceivable that a rapidly-working Midshipman would complete Core Segment 3 and pass Progress Check 3 and go directly to Core Segment 4, backing up a few days later to participate in the group discussion for Depth Segment 1. Thus, the prescriptive analysis form for Progress Check 3 might say to the passing

* Read PC-1 here as PC 1-Depth; it is not the same test as followed core and remedial segment I.

student, "Go to instructor and determine date of Depth Segment 1; sign up readiness for same." Then, the analysis form might say, "If date of Depth Segment 1 is in future, go directly to Core Segment 4."

Another frequent structural occurrence is the availability of an enrichment segment to accompany some of the core segments. Assume that Core Segments 1, 2 and 3 also have an accompanying enrichment segment. The flow would look like this:



The dotted line indicates that the enrichment section is not mandatory; however, see Section 4 for an exception to this rule. Note that the enrichment segment has a progress check; in this case, it is for the Midshipman's own information and has no pass-fail connotation.

Putting this flow of four segments into a real-time context, we can develop the following general pattern. Because a segment takes about 40 to 80 minutes to complete, a student going through the core segments without needing remediation should easily complete Segment 3 after about two calendar days (using approximately 40 mintues for each classroom day, plus 80 minutes of outside

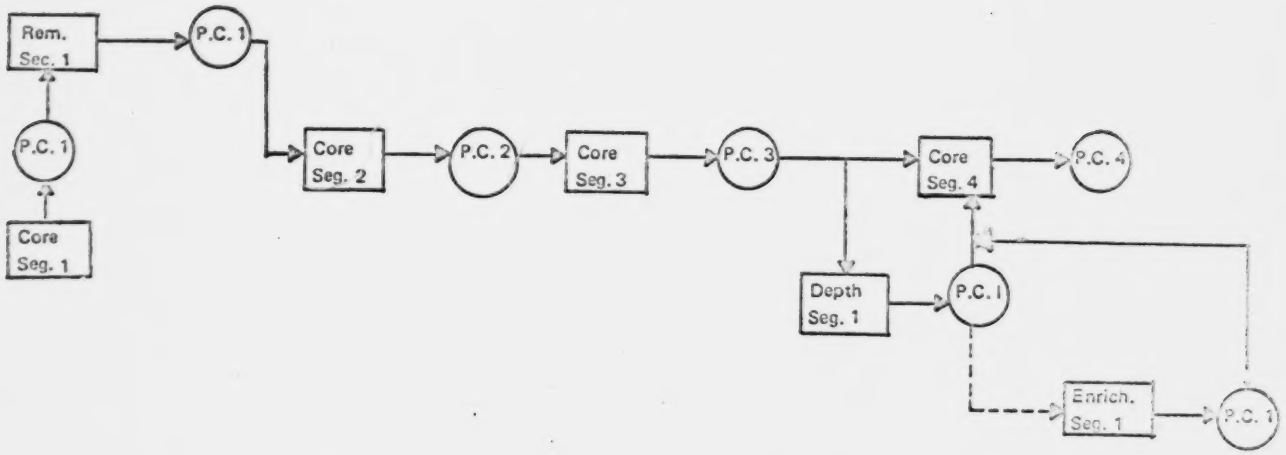
* Read Pc-1 here as Pc-Enrich.

work generally required by the USNA). Allowing another day for remediation and another day for slack time, the depth segment could be safely scheduled for the fourth calendar day. On that day, some Midshipmen would be just finishing Core Segment 3, others would be into or beyond Core Segment 4, and some could conceivably have completed Enrichment Segment 1, as well. They would gather together for the required depth segment group discussion.

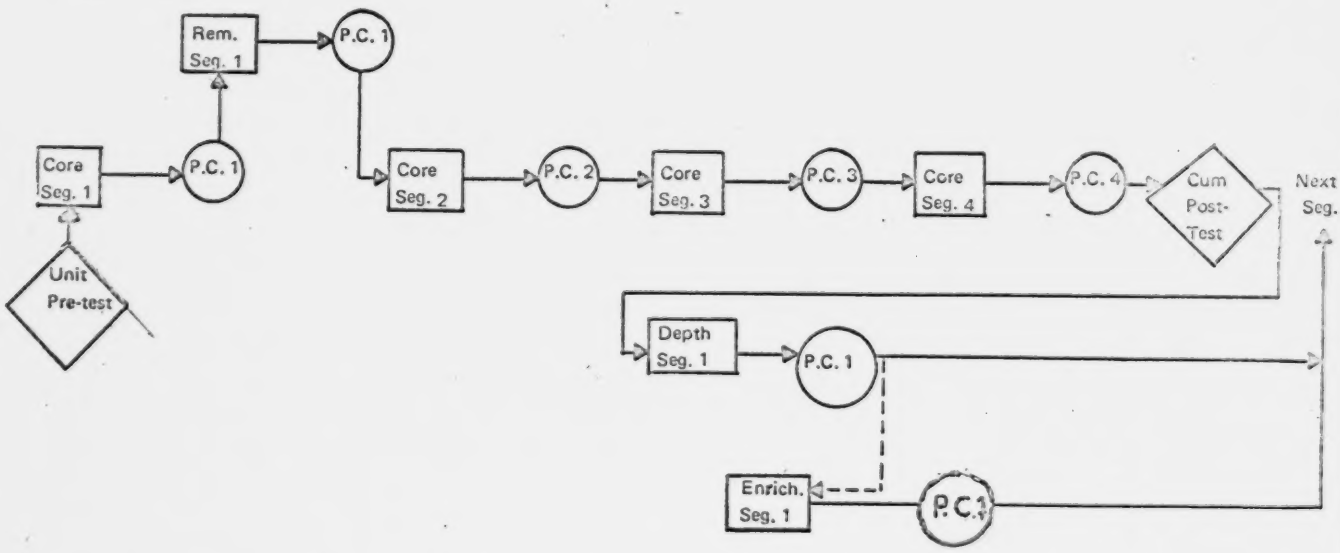
Following this general pattern, the Midshipman would work his way through the segments of Part 1, and those following. Near the middle of the semester, the mid-term examination would be scheduled. Midshipmen well ahead of the mid-semester content would be allowed to work on until such a date. Because of the incentive nature of the mid-term, it can be a useful instruction tool to keep all Midshipmen on a minimum speed schedule, while not penalizing the fast-working student. All Midshipmen would have to conclude the course by semester's end, and the final examination would be delivered simultaneously to all course participants.

5.2 RESEARCH CONSTRAINTS

As was noted in Section 3, the unit-module concept necessary for the testing of certain research hypotheses imposes an additional delivery constraint on the course structure. Using the flow example discussed above, these constraints can be graphically depicted as follows:



Assume that Core Segments 1, 2, 3, and 4 all make up a unit classification to test the frequency and nature of the hypothetical response-demand hypotheses used in Section 4 of this report. If this were the case, neither the enrichment nor the depth segment could be made available to any Midshipman until he had taken the cumulative post-test accompanying this unit. The flow would look like this:



Note that any one Midshipman need not await the completion of the cumulative post-test by his peers in a module of the same unit. While it might be useful to impose this condition on the course strategy for the sake of research, this constraint was deemed too severe.

5.3 SPECIFIC LOGISTICS

This subsection will review the basic flow set out above, but in base operational terms. Because operations vary depending upon the type of segment involved, this summary is broken down into logistics of core and remedial segments, depth segments, enrichment segments, the logistics of evaluation, and the instructor logistics. The Appraisal Selection Action (ASA) charts in the appendix review many of these factors from another viewpoint.

5.3.1 Core and Remedial Logistics

a. Student is assigned module and segment(s).

b. Student locates material.

c. Student interacts with module materials (in or out of class, depending upon the nature of the module).

d. Student records start and end times, as he interacts with material (record sheet located in student manual).

e. Student takes progress check upon completion of segment (progress check located in student manual).

f. Student grades progress check and marks prescription analysis sheet and follows instructions:

   1) Takes remedial action.

   2) Goes to depth or enrichment segment.

   3) Goes to next core segment.

g. Student turns in progress check and prescriptive sheet.

h. If remedial action is taken, student records times, works through to the progress check, and deposits progress check and analysis form. (If student fails again, the

remedial section prescriptive analysis sheet directs student to instructor for instructor action.)

5.3.2 Depth Segment Logistics

When a certain number of students have reached the minimum requirements for a depth segment, the instructor announces the date of an upcoming depth segment on the student assignment board and names students who are expected to attend. Generally, the depth segment can be held on the session following the announcement, however, the constraints of the research unit and modules must be taken into account in the scheduling of depth segments. Once scheduled, the depth segment operates as follows:

a. Student attends depth session.
b. Student completes depth segment.
c. Student takes progress check for depth segment.
d. Student grades progress check.
e. Student who fails progress check takes remedial work at the instructor's option only.
f. Student who passes, files progress check and prescriptive analysis, and then goes to next core segment (or enrichment segment if he desires and if it is available).

5.3.3 Enrichment Segment Logistics

Except where it is deemed necessary to require some Midshipmen to take the enrichment segment, the student need not take such a segment, if it exists as an alternative on his latest prescriptive

analysis sheet. Otherwise, it operates as follows:

a. Student decides to take enrichment segment.
b. Prescriptive analysis sheet reveals if such activity is compatible with the unit-module constraints of the research design. (If it is too early, i.e., he has not taken the cumulative post-test, he must go on through such activity.)
c. If permissible, student takes enrichment materials.
d. Student records start and end times in student manual.
e. Student completes enrichment segment.
f. Student takes enrichment segment progress check.
g. Student deposits time sheets and progress checks.
h. Student goes to next core segment.

5.3.4 Evaluation Logistics

As was noted in the logistics descriptions above, as the student completed work in a segment, he deposited in the classroom certain materials. All student response media (workbook, paper and pencil, tapes, time-in contact sheets, progress checks, prescriptive analysis sheets, etc.) will be deposited in specific locations in the classroom and will be dealt with as follows:

a. All progress checks and cumulative post-tests will be left in the test box in the classroom area.
b. All other student response information, time sheets, and analysis forms will be deposited in a separate box in the classroom area.

c. These items will be collected by the WLC staff daily.

d. Data from the progress checks, cumulative post-tests, and other test instruments will be transferred by the WLC staff in source document form to MRC.

e. MRC will reduce such data to a computable form for analysis.

f. Other response media will be transmitted weekly to BSD in Albuquerque.

g. Data summaries for validation will be sent from MRC to BSD weekly.

5.3.5 Instructor Logistics

The instructor will maintain regular class hours, as he must be available to his students for assistance in the system procedures, remediation, and scheduling. The advantage here is that the instructor, when giving course-specific aid or when giving general guidance and counseling, will be doing so on an individual basis. Depth segments, requiring that the instructor becomes a content display device, will also require his presence. Materials location and monitoring activities, as well as other required system supportive activities, will be set forth in an Instructor's Manual. Group discussions and other types of depth segment activities will also be set out in the Instructor's Manual. These depth segment discussions in the manual may range in explicitness from the loose outline of topics to be covered in group discussions and a progress check covering such topics, to a detailed description and accompanying scripts, etc., for a role playing situation. As an example

of how the Instructor's Manual might sound, consider the following possible instructions regarding remediation:

1. Special Remediation. Where the student has failed a remedial section on a depth segment progress check.
   a. Ask student if he knows why he is having difficulty. If easily detected, tutor him individually.
   b. Examine progress check(s) to see if difficulty can be jointly determined in this manner (tutor at this point).
   c. When you are satisfied as to the Midshipman's level of comprehension, pass him on to the next appropriate segment and record anecdotal summary of session (with time factors) on the instructor's remedial report sheet and deposit in the proper box for collection.

APPENDIX A

PRESENTATION VARIABLES

PRESENTATION VARIABLES

1. Stimulus representation
   a. verbal-written: written material, such as printed text.
   b. verbal-spoken: voice transcriptions, such as from a lecturer, videotaped lecture, or tape recorder.
   c. pictorial: illustrative material, such as pictures.
2. Duration
   a. transient: instructor-controlled presentation of material which becomes unavailable after it has been presented, such asmovie or lecture.
   b. persistent: student-controlled presentation of material which remains available to the student, such as a text.
3. Response demand frequency (RDF)
   a. high RDF: relatively frequent demand for a response in an instructional sequence, such as in programmed texts where a response is required in each frame.
   b. medium RDF: relatively moderate demand for a response, such as question which follows ten minutes of video-taped lecture.
   c. low RDF: low (frequency) demand for a response, as when a "review" question follows a chapter of textual material.
4. Response demand (RD)
   a. overt-written: the student responds to a question by writing the answer on a prepared answer sheet. A measurable constructed response.
   b. overt-vocal: the student responds to a question by saying the answer into a tape-recorder. A measurable

constructed response.

c. overt-selected: the student responds to a question by choosing the appropriate answer from a number of possible answers, such as a multiple-choice test.

d. covert: the student response to a question by "thinking" of the answer; he is not required to provide a measurable response. Thus, this is a non-measurable, constructed response.

5. Management frequency (MF)

a. high MF: relatively high frequency of decision to alter the presentation based on the student's response to a question. Management frequency may be built into the instructional system, as in a text where the "decision" is made-on the basis of a response to every frame - to advance the student to the next frame or to remediate him on the same frame. The management frequency may also be determined extemporaneously, as when the lecturer asks the class a question; if no one answers, the instructor may decide to review previous content.

b. medium MF: relatively moderate frequency of decision to alter the presentation based on the student's response, such as having a quiz after a 10 minute film, and on the basis of the student's score, either repeating the film on proceeding to new material.

c. low MF: relatively low frequency of decision to alter instructon based on the student's response to a question, such as a lecturer giving a quiz after 40 minutes of lecture; based upon the student's score, the instructor either assigns homework problems or does not

N.B. The response demand frequency must be equal to or more than the management frequency; you can't make decisions about a response more frequently than you call for that response. One example of a presentation in which RDF exceeds MF is the lecturer who frequently asks the class "rhetorical questions," the instructor does not change his presentation on the basic of the student's (covert) responses, yet he does call for those responses. In this case the RDF would be high but the MF would be low.

6. Management type

   a. repetition - if the student does not answer a question correctly he is presented the same material again.

   b. multi-level - (Crowder type) : if the student does not answer a question correctly he is presented a "simpler" (more highly prompted) version of the same question

   c. error-diagnostic - if the student does not answer a question correctly, his wrong answer is discussed and he is directed to review the source of his error.

APPENDIX B

MANAGEMENT DIMENSIONS

ASA SUMMARY

MANAGEMENT DIMENSIONS

ASA SUMMARY

Achievement Management:

Purpose - to insure all students have mastered the objectives of the segment.

Need Management:

Purpose - to insure students receive only those materials which they require to meet the objectives.

Prescription Management:

Purpose - to insure a given student receives the most appropriate materials to meet the objectives in terms of his individual characteristics (as determined by efficiency and effective measuring).

Motivation Management:

Purpose - to insure continual student contact with the materials and to increase student learning rate.

Enrichment Management:

Purpose - to provide for additional information relevant to the objectives, but not necessary for their achievement.

Systems Management:

Purpose - to provide logistic support relevant to materials availability, scheduling, administrative grading, and maintenance of the operating instructional system.

INSTRUCTIONAL SYSTEMS

FUNCTIONAL IDENTIFICATION CHART

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of Achievement

APPRAISAL	SELECTION	ACTION
DATA	SIGNAL	TASK
100% on the Progress Check	Course Invective	Go to next segment.
0 - 80% on Progress Check On segment with parallel module.	Prescriptive Analysis Form - Keyed direction	Take Alternate Module.
0 - 80% on Progress Check On segment with Remedial module.	Prescription Analysis Form - Keyed direction	Take Remedial Module.
Score less than 100 on second try of module.	Course Invective	See your instructor.

INSTRUCTIONAL SYSTEMS

FUNCTIONAL IDENTIFICATION CHART

of Motivation

APPRAISAL	SELECTION	ACTION
DATA	SIGNAL	TASK
100% on Progress Check	If signaled on Instructional Guide	Leave Early.
100% on Progress Check	If signaled on Instructional Guide	Student preferred media on next segment.
100% on Progress Check	If signaled on Instructional Guide	Take a break.

Westinghouse Learning Corporation

INSTRUCTIONAL SYSTEMS

FUNCTIONAL IDENTIFICATION CHART

of Enrichment

APPRAISAL	SELECTION	ACTION
DATA	SIGNAL	TASK
Self-desire	If option is available on Instructional Guide.	Take formal enrichment unit.
Experimental Requirements	If option is available on Instructional Guide.	Take formal enrichment unit.

INSTRUCTIONAL SYSTEMS

FUNCTIONAL IDENTIFICATION CHART

of Prescription

APPRAISAL	SELECTION	ACTION
DATA	SIGNAL	TASK
(Possible Data)		
1. Student characteristics	Teacher Statement	Do Module X.
2. Previous Achievement on similar presentations.	"	"
3. Experimental Constraints.	"	"

Westinghouse Learning Corporation

INSTRUCTIONAL SYSTEMS

FUNCTIONAL IDENTIFICATION CHART

of Need

APPRAISAL	SELECTION	ACTION
DATA	SIGNAL	TASK
Demonstrate complete mastering on Pre-test	Instructor Statement	Skip next segment.
Demonstrate partial mastering on Pre-test	Instructor Statement	Do only Section X of Module Y.